

W. H. HARRISON.
Steam Boiler Furnace.

No. 231,315.

Patented Aug. 17, 1880.

Fig. 1

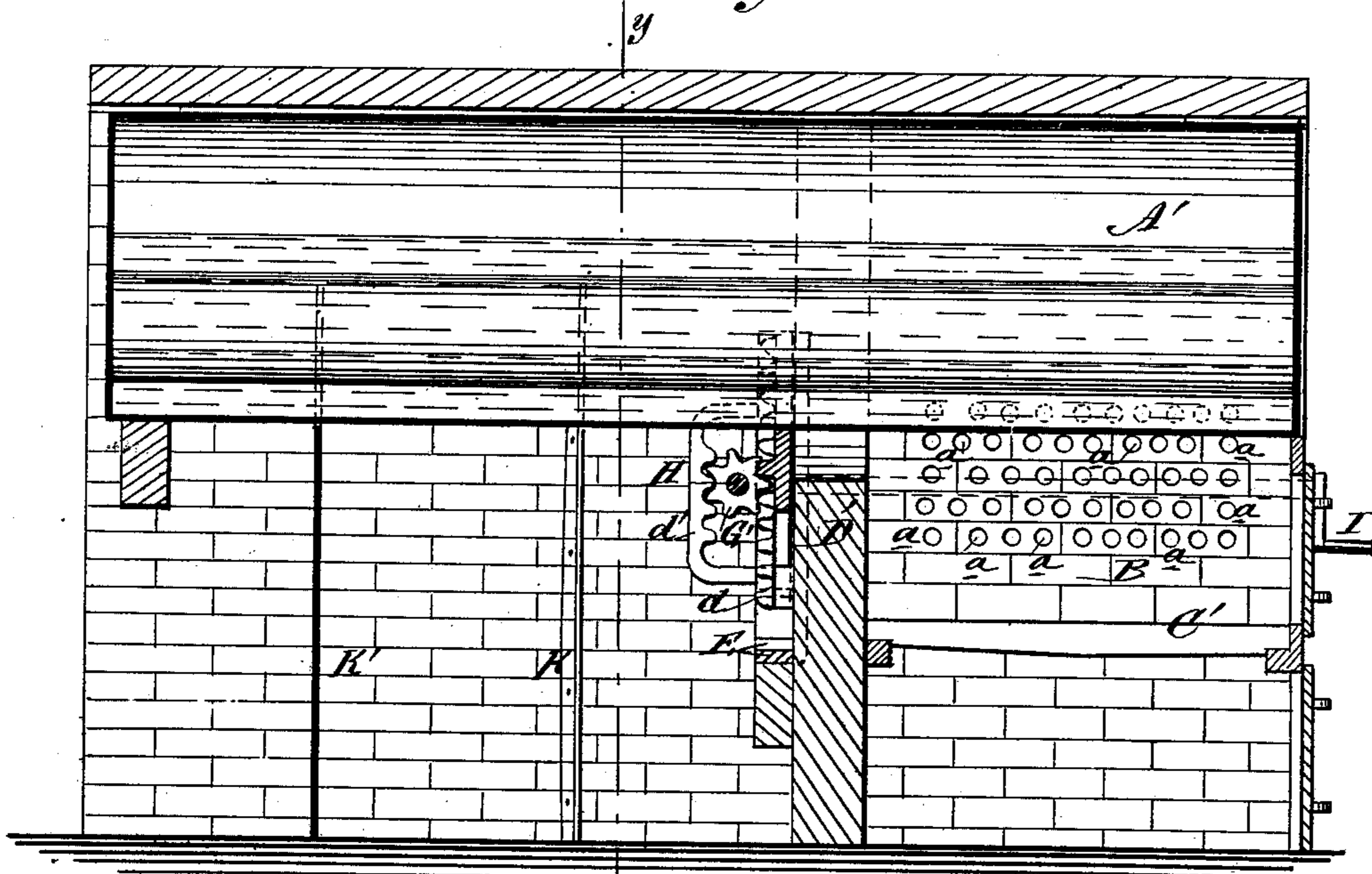
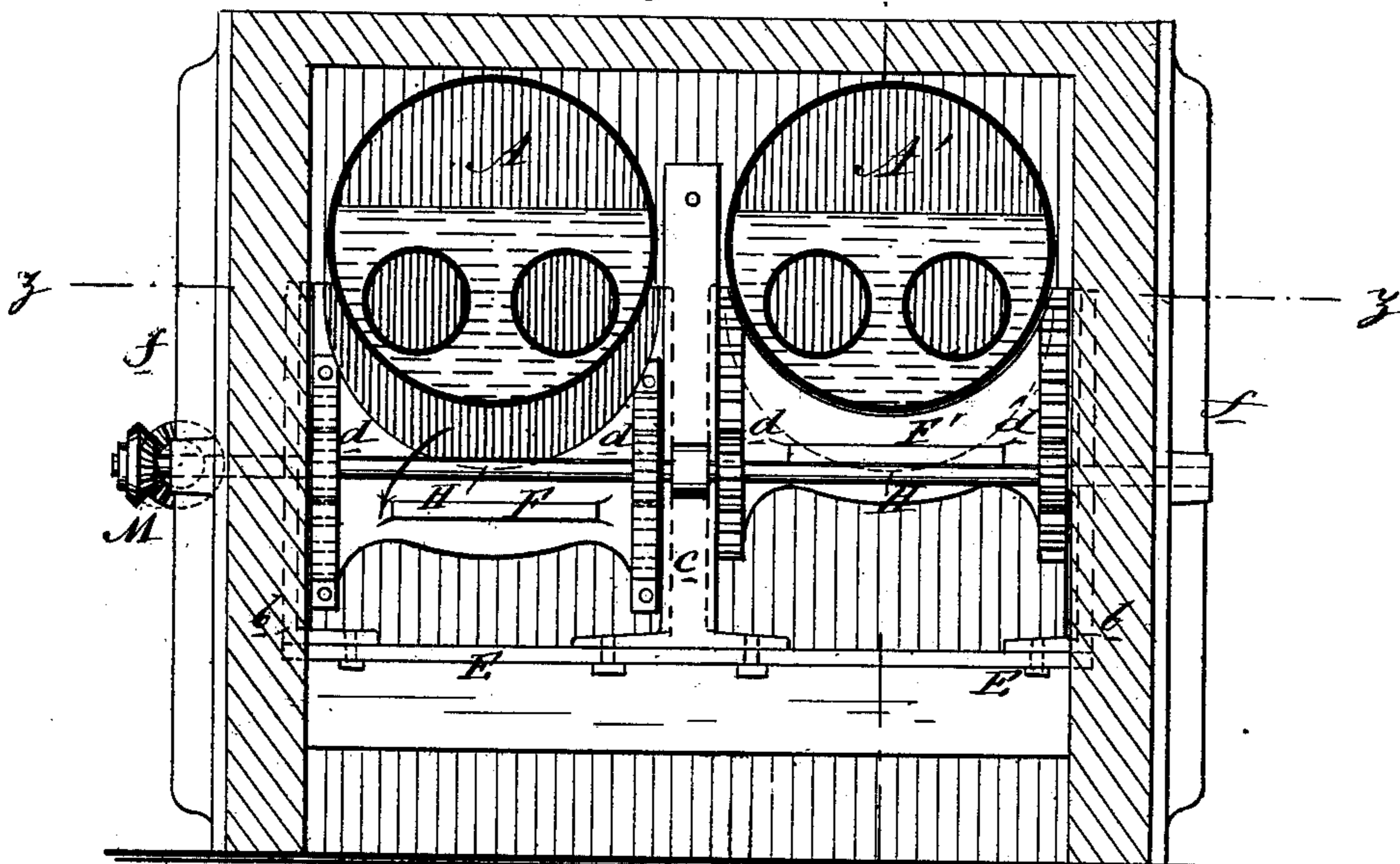


Fig. 2



WITNESSES:

C. Verneux
C. Sedgwick

INVENTOR:

W. H. Harrison

BY

Mum & Co

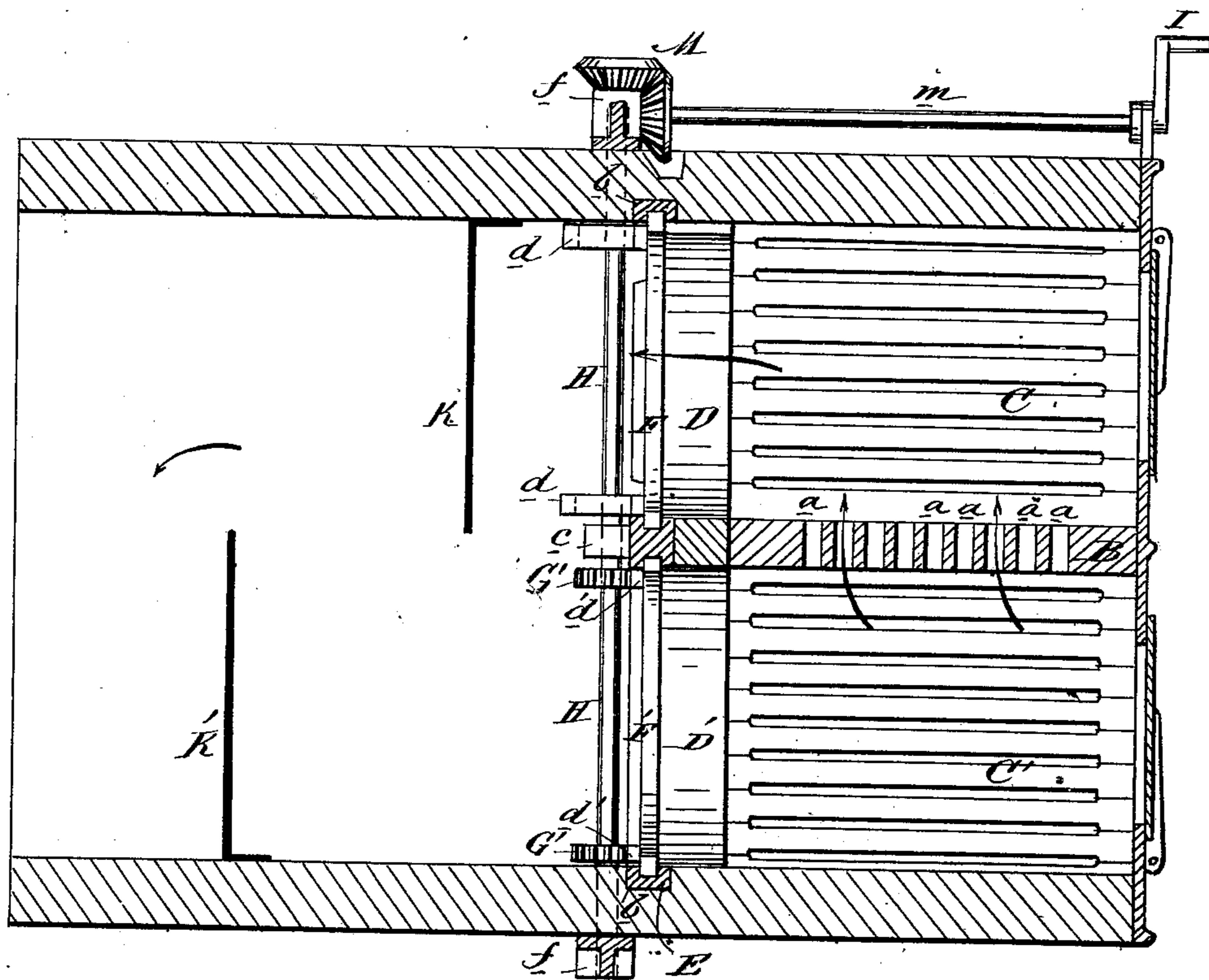
ATTORNEYS.

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Fig. 3



WITNESSES:

C. N. Evans
C. Seagwick

INVENTOR:

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UNITED STATES PATENT OFFICE.

WILLIAM H. HARRISON, OF LOUISVILLE, KENTUCKY.

STEAM-BOILER FURNACE.

SPECIFICATION forming part of Letters Patent No. 231,315, dated August 17, 1880.

Application filed February 11, 1880.

To all whom it may concern:

Be it known that I, WILLIAM H. HARRISON, of Louisville, in the county of Jefferson and State of Kentucky, have invented a new and Improved Steam-Boiler Furnace, of which the following is a specification.

Figure 1 is a longitudinal sectional side elevation of the furnace on line *xx*, Fig. 2. Fig. 2 is a transverse sectional rear elevation on line *yy*, Fig. 1. Fig. 3 is a sectional plan view on line *zz*, Fig. 2.

Similar letters of reference indicate corresponding parts.

The object of this invention is to secure more perfect combustion of the fuel and gases under boilers, and to better utilize the heat thereof.

The invention is especially designed for nests of two or more boilers; and it consists of a perforated brick wall placed between the fire-boxes, of reciprocating dampers arranged under the boilers in rear of the bridge-walls, and of abutments or baffle-plates extending laterally into the flues under the boilers from the sides of the flues.

In the drawings, *A A'* represent two cylindrical flue-boilers set in position. The division-wall *B* of the fire-places is carried up solid for several inches above the grate-bars *C C'*, and is then filled with perforations *a a* as far up as on a level with the boiler-bottoms. *D D'* are the bridge-walls, behind which the frame *E* is fixed, so that its grooved end pieces, *b b*, and its central grooved standard, *c*, project upward, to serve as supports and slides for the dampers *F F'*, that have their upper edges shaped to conform with the curve of the boilers, and are provided with ratchets or racks *d d'*, in which engage the pinions *G' G'*.

Passing transversely under the boilers *A A'*, and in rear of the dampers *F F'*, is the shaft *H*, whose ends are journaled in the buckstraps *f f*, and whose center is supported by the standard *e*; and keyed on this shaft *H* are the pinions *G' G'*, that engage in the ratchets or racks *d d'* of the dampers *F F'*. The crank *I*, rod *m*, and bevel-gears *M*, secured to the shaft *H* outside of the supporting-wall of the boilers, serve for turning said shaft *H*, and on

turning the shaft *H* one of the dampers *F F'* is always closed upward, while the other is opened downward.

K K' are the abutments or baffle-plates extending from opposite sides of the boiler-supporting walls and partly across the flue under the boilers, so as to form, in effect, a zigzag flue, for the purpose of longer retaining the heated products of combustion in contact with the boilers.

Ordinarily, when fresh coal is supplied to boiler-fires a considerable portion of it passes up the stack in the form of smoke or unconsumed gases, thus entailing a direct loss of fuel and a reduction of the temperature under the boiler.

To prevent this the within-described device is made to operate in the following manner: For example, when fresh coal or other fuel is supplied to the grate *C* the crank *I* is turned so as to close the damper *F* and open the damper *F'*. Then the smoke and gases from the fresh coal will pass through the perforations *a a* in the division-wall *B*, and over the bright fire on the grate *C'*, where they will become sufficiently heated to combine with the air passing up through the said grate *C'*, or with air that may be introduced in any other way. The flame and burning gases will then pass over the bridge-wall *D'*, and under the boilers *A A'*, and on their way to the smoke-stack will be retarded and diverted by the abutments or baffle-plates *K K'*, so that they (the said flame and gases) shall impart more of their heat than they otherwise would to the boilers.

When fresh fuel is supplied to the grate *C'* the positions of the dampers *F F'* are reversed, and the products of combustion pass through the perforations *a a*, and over the fire on the grate *C*, and thence over the bridge-wall *D*.

It will be seen that the dampers *F F'* are designed for changing the direction of the products of imperfect combustion through the perforations in the division-wall *B*, in order to secure the more complete combustion of said products, a higher temperature under the boilers, and a consequent greater evaporation of water.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

The combination of two boiler-furnaces divided by a wall, B, perforated in its upper part and provided with dampers F F' in front of bridge-walls, and baffle-plates extending

into the flues under the boilers, whereby a zigzag course is given to the gases, as and for the purpose specified.

WILLIAM HENRY HARRISON.

Witnesses:

WM. INGRAM,

J. W. ROBINETTE.